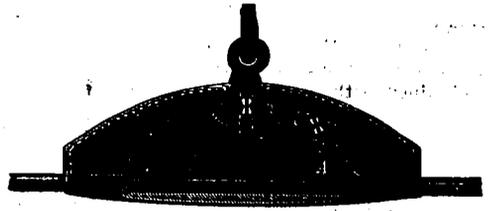


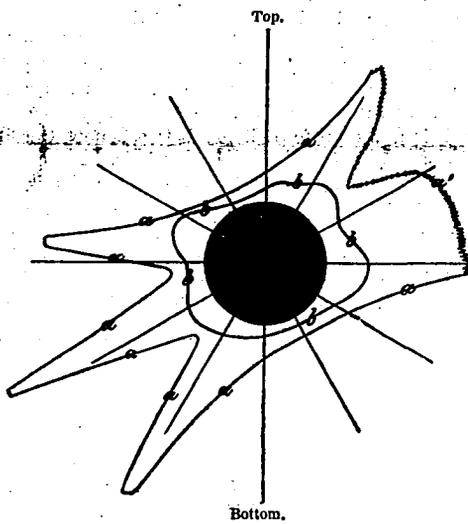
Georgia, South Carolina, and North Carolina, and will even touch Virginia. The track of totality begins on the Pacific Ocean just west of Mexico, enters the United States near New Orleans, and passes in a north-easterly direction until it reaches the sea at Norfolk and Cape Henry. Its path then crosses the Atlantic Ocean and touches Portugal, Algiers and North Africa, and will terminate near the northern end of the Red Sea. The eclipse will last 1 minute and 12 seconds near New Orleans, and 1 minute and 40 seconds near Norfolk. It is probable that large numbers of people will take the railroads to points where the eclipse can be seen. A number of experimental stations will be established by the government along the path of the eclipse. The necessary apparatus is now being gathered and arranged, and men specially adapted for the work are being engaged and are trained. Congress has allowed \$5,000 to the Naval Observatory and \$4,000



A SIMPLE FORM OF WIRE-HANGER.

THE COMING ECLIPSE.

The total eclipse of the sun on May 28, instead of passing over the sparsely settled regions of the world, will cross the States of Louisiana, Mississippi, Alabama,



OUTLINE METHOD OF SKETCHING IN THE FORMS OF THE INNER AND OUTER CORONA.



PATH OF THE TOTAL ECLIPSE OF THE SUN, MAY 28, 1900.

to the Smithsonian Institution for this purpose. The Naval Observatory will send out two expeditions. They will probably be located in North Carolina and Georgia, 200 miles apart. The Weather Bureau is collecting data of the weather conditions in past years in the month of May for the localities along the line of totality. So far they show there is less chance of cloudiness in Central Georgia and Eastern Alabama and this is, therefore, the best region for locating the eclipse stations. The stations will be occupied two or three weeks before the eclipse, and the part which each man will take will be thoroughly rehearsed. It is very imperative to make no mistakes during the minute and a half when observations can be made.

The Smithsonian Institution officers will be under Prof. S. P. Langley, those of Princeton University under Prof. Young, those of the University of Pennsylvania under Prof. Stone, and the Yerkes Observatory will conduct the expedition with Prof. Hale at its head. Nearly every college and scientific institution in the country will be represented, and probably 100 expeditions will observe the eclipse in the path of totality in addition to large numbers of scientific amateurs, who will make extended observations. Prof. Brown, of the Naval Observatory, considers that there will probably be thousands of these unattached amateurs. It should not be forgotten that one of the finest sets of photographs of the eclipse in India, in 1896, was taken by an amateur with a home-made camera. The expeditions sent out by the Naval Observatory will consist of only five or six observers. The same observatory has issued a little pamphlet containing a map of the path of the eclipse showing the various towns, railroads, streams and elevations, and it contains suggestions for observing the eclipse.

Doubtless many of our readers will be interested in knowing how to make amateur observations. Preliminary preparations should be carefully made where it is intended to sketch the corona with the naked eye. Those who expect to make a sketch of the corona unaided, will have to confine their attention to sketching outlines or to some other particular feature, otherwise they will result in hasty and inaccurate work. Co-operation of groups from two to five sketchers is strongly commended. A sheet of paper of convenient size, of say 9x12 inches, should have drawn upon it a black disk 1 1/4 inches in diameter, to represent the moon, with straight lines radiating at an angle of 80 degrees, as shown in our diagram. The positions of the various parts of the corona, as seen projected against the sky are best referred to a vertical line obtained by mounting a plumb-line so it is seen over the moon's center. The diagram upon which the drawing is to be made it is to be placed upon any convenient support so that the lines marked "Top," "Bottom" shall be in the plane of the plumb-line, the top part corresponding to the top string. The diagram also shows the outline method of sketching in the forms of the inner and outer corona, where the principal stress is laid upon the inaccuracy of the position and form. It is a reproduction of a drawing made by E. J. Stone in 1874. *a, a, a*, shows the outer corona, the part *a'* indicating a faint and undefined boundary, *b, b, b*, shows the inner corona. This sketch forms no part of the diagram to be used in the coming eclipse, but is placed on the diagram

only as an illustration of the method. The dimensions of the various parts of the eclipse can be made with accuracy by estimating them in terms of the moon's diameter as a convenient unit. The party should practice together beforehand, each sketching only his proper quadrant from a corona drawing suspended at the angular height of the sun. The time of exposure of drawing should be slightly less than the known duration of the eclipse. White chalk on purplish blue paper gives admirable results. On eclipse day the sketchers should avoid fatiguing their eyes by too much observation of the preceding partial eclipse and should rest the eyes for the last five minutes before absolute totality.

Photographs of the corona are of great scientific value, and may be obtained with instruments of moderate dimensions. Almost any good rectilinear lens may be used. One with an aperture of  $2\frac{1}{4}$  inches and of a focal length of  $32\frac{1}{2}$  inches proved very satisfactory in the Indian eclipse expedition of 1898. For plates of ordinary sensitiveness exposures of one or two seconds are ample. It is better to use a plate of normal sensitiveness instead of an extra rapid one, and to lengthen the exposure in proportion, because a slower plate is easier to handle and permits of a more restricted and prolonged development and is less liable to accidental fogging. Photographs taken with amateur instruments are, of course, not as valuable as those taken with instruments provided with a driving clock or other device for keeping the image stationary on the plate. In focusing, the instrument should be pointed at a well-defined object distant say from one-quarter of a mile to a mile, and the object brought to a short focus for center plate. The image of the sun is really a small object and occupies but a comparatively small part of the center of the field. The focal length of the camera in inches will give roughly the diameter of the sun's image in hundredths of an inch. Negatives should not be retouched.

While a proper telescope is desirable, small spy-glasses and opera glasses may be used. For the first and last contact shade glasses are necessary. The usual and most objectionable color for a shade is red, either a neutral tint or green should be used, and deep blue is also recommended. Instruments specially intended for observing the sun are always provided with arrangements for getting rid of the excessive light and heat without diminishing the aperture, and often without using shades. Special care must be taken that the temperature of the tube is the same as that of the outside air. The first contact is a slight indentation in the sun's limb, and it usually attains some size before the observer, unless he is specially trained, sees it. The internal contacts, or beginning and end of totality,

are phenomena of such a definite character that the instant of their occurrence can be noted within a small fraction of a second. For a minute or two before the predicted time of second contact the sun's thin and

now fast-waning crescent should be carefully watched through a neutral or green shade glass. Presently the crescent will become a mere thread of light, which will rapidly shorten and suddenly disappear. The ap-

proach of the third contact will be heralded by the rapid brightening of the chromosphere at the point of the moon's limb, where the sun is about to reappear, and two or three seconds later a sudden burst of light will announce the contact itself, and with it the termination of totality. The observation of the fourth contact is a simple matter. The segment cut out of the sun by the retreating limb of the moon is carefully watched as it becomes less and less, and the instant of its final disappearance is noted as the fourth contact. Very precise directions are given by the Naval Observatory authorities for amateur telescopic observing parties, and are sent by them on request.

In our chart the shadow path is crossed at more or less uniform intervals by straight dotted lines which terminate in the north and south limits of totality. Each of these lines is approximately the locus of all points for which the middle of total eclipse occurs at the moment of Greenwich mean time indicated thereon. The adopted interval is five minutes. The longer dotted lines include points for each. Either the beginning or ending of partial eclipse will occur at the moment indicated.